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10/588,645	05/15/2007	Uwe Limbeck	102063.56866US	9792

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EXAMINER	
LI, JUN	
ART UNIT	PAPER NUMBER
1793	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/588,645	LIMBECK, UWE	
	Examiner	Art Unit	
	JUN LI	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 December 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102/103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claim1-3 and 5-6, 12 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Rock et al (EP1113516).

Rock et al teach method to cold start a solid polymer membrane fuel cell wherein oxygen and hydrogen are supplied to the cell so that the reacted fuel causes the fuel cell to heat up from subfreezing temperature([0002], [0006], [0007], [0009], [0015], clms, Fig). Rock further teaches a high temperature (about 80°C) can be reached via heating a fuel cell stack (at a temperature about -20°C) by the electrical current drawn from the cell to supply additional heating to heating devices (e.g. IR heating) . Rock also discloses circulating a coolant with a combustor by use of a pump through the stack wherein after the fuel cell stack reaching a preset temperature the heating of the coolant is discontinued ([0016]).

All the recited limitations are either taught or expected from Rock et al, thus they are anticipated by or obvious over Rock et al. It would have been obvious to one of ordinary skill in the art to adopt the power from the fuel cell to operate some auxiliaries such as compressor to supply reactants such as O_2, H_2 for a needed electrochemical reaction in fuel cell for providing internal heating for helping the fuel cell reach normal operation mode as shown by Rock.

2. Claim 4 is rejected under 35 U.S.C. 103(a) as obvious over Rock et al (EP1113516) as applied to claim 1-3, 5-6, 12 above, and in view of Edlund (US6495277).

Rock is silent about operating the recited operating capacity and the starter battery.

Edlund teaches using a supplemental battery for the fuel cell processing assembly from an off to a start up mode wherein a control system (item 30) is used to control the amount of power drawn from the fuel cell stack (item 14) to prevent damage to the fuel cell stack (Fig 1, col 7 ln 57-67, col 8 ln 1-6).

It would have been obvious to one ordinary skill in the art to control the fuel cell capacity amount as shown by Edlund to practice fuel cell system of Rock because controlling the fuel cell capacity at a proper amount will help prevent fuel cell damage. Furthermore, one of ordinary skill in the art would have been obvious to operating such fuel cell at a probable capacity via routine optimization (See § MPEP 2144.05 [R-5] II).

3. Claim 7 and 9 are rejected under 35 U.S.C. 103(a) as obvious over Rock et al (EP1113516) as applied to claim 1-3, 5-6, 12 above, and in view of Amrhein (US2003/0124399).

Rock is silent about the burner is operated by hydrogen and is a gas burner.

Amrhein teaches using residual hydrogen from fuel cell unit to operate the burner with improved total energy efficiency of the fuel cell apparatus.

It would have been obvious to one ordinary skill in the art to adopt the hydrogen to operate the burner as taught by Amrhein to practice the burner of Rock because

hydrogen operating the burner can help utilize the residual hydrogen fuel from fuel cell thus improve the energy efficiency. It is to be noted that a hydrogen burner is already a gas burner and one of ordinary skill in the art would have been obvious to choose an efficient gas burner such as a high-performance gas burner as recited in the instant claims to improve the energy utilization efficiency.

4. Claim 8 and 10-11 are rejected under 35 U.S.C. 103(a) as obvious over Rock et al (EP1113516) as applied to claim 1-3, 5-6, 12 above, and in view of Bloomfield(US3976507).

Rock already teaches an air compressor (Fig, [0015]) wherein supplying oxygen to the fuel cell and burner is an expected feature associated with this compressor.

Regarding claim 8 and 10-11, Rock is silent using same compressor to supply air for both burner and fuel cell and the adjusting the ratio of the air.

Bloomfield teaches using a compressor (item 40) supplying air to both fuel cell stack (item 12) and a burner (item 20) via an air control box (item 48) a certain volume ratio of air supplied to fuel cell stack and burner respectively (Fig 1, col 3 ln 52-65, col 5 ln 1-5) wherein the gas supplied to the burner need be enough to drive the compressor.

It would have been obvious to one of ordinary skill in the art at the time of invention filed to one compressor for supplying air to both fuel cell stack and burner via an air box controller to provide enough force from the burner for driving the compressor as shown by Bloomfield (col 3 ln 52-65, col 5 ln 1-5). Furthermore, one of ordinary skill in the art would have been obvious to adopt a proper air volume ratio between burner

and fuel cell stack such as recited in the instant claims via routine optimization (See § MPEP 2144.05 [R-5] II).

5. Claim 13 and 14-15 are rejected under 35 U.S.C. 103(a) as obvious over Rock et al (EP1113516) as applied to claim 1-3, 5-6, 12 above, and in view of Fuller (US6068941).

Rock is silent about using a starter battery to supply power to auxiliaries.

Fuller teaches using a battery as an auxiliary power source to operate the air blower (item 30) and water pump for providing reactant for the fuel cell (col 3 ln 1-27, Figure). Fuller also discloses when the fuel cell reaches a certain temperature a normal fuel cell operation will start thus terminating the auxiliary power source such as battery is expected because normal fuel cell operation can already providing electric current.

It would have been obvious to one of ordinary skill in the art at the time of invention filed to adopt a starter battery to help providing reactants and heating for the fuel cell to reach a normal operation as shown by Fuller.

Response to Arguments

Applicant's responses filed on 12/22/2009 have been acknowledged and previous 112 rejection on claim 6 has been withdrawn due to applicant's amendment.

Applicant's arguments filed on 12/22/2009 have been fully considered but they are not persuasive. In response to applicant's arguments about supplied Rock reference (EP1113516) not a 102 (b) prior art reference, it is noted that Rock's publication date of application is April 7th 2001, but the patent granted date is April 28th, 2004. In order to

qualify as a proper 102 (b) prior art, only the publication date need to be more than 1 year prior to the effective US filing date of the instant application which is May 11th 2004. Thus the publication date of the applied Rock reference is at least more than 1 year prior to the effective US filing date of the instant application.

In response to applicant's arguments about no suggestion using the electrical current drawn from the stack to heat the coolant as well as the coolant pump, Rock discloses that electrical current can be drawn from the stack and internal IR heating of the stack begun, thermal start-up of the stack can further be effected by heating the coolant (e.g. with a combuster) that normally circulates through the stack to cool it, and that once the stack is up to temperature, heating of the stack coolant is discontinued, and it resumes its normal cooling function ([0016]) wherein heating devices operated by the electric current drawn from the stack and combustor is one type of heating device, thus heating the coolant is taught. Furthermore, Rock teaches using only electric current drawn from the fuel cell stack to operating this fuel cell cold start-up wherein the coolant circulation during the start-up has to be powered by a device (i.e. coolant pump) , thus operating the coolant pump by the only power source drawn from the fuel cell stack is either taught or expected absent evidence to the contrary. Similar reason is applied for operating auxiliary devices such as compressor during this fuel cell stack cold-start process. Rock also discloses that fuel cell stack can produce energy (electric current) for different types of electric applications ([0006]). In order for the coolant pump to function properly, there must have a power source to drive this pump for circuiting the coolant in the fuel cell stack and a fuel cell stack can provides such energy

(power sources), thus one of ordinary skill in the art would have been obvious to adopt such power sources from the fuel cell stack to drive the coolant pump for helping ensuring an effective cooling function for the fuel cell stack. Similar reason applies to the compressor as well. Thus the claimed subject matter is just an obvious modification over the applied references.

Conclusion

No claims are allowed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUN LI whose telephone number is (571)270-5858. The examiner can normally be reached on Monday-Friday, 8:00am-5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JUN LI/
Examiner, Art Unit 1793
02/19/2010

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793